Patent claims

1. A surface-mountable miniature luminescent diode and/or photodiode with a chip package which has a leadframe (16), and
a semiconductor chip (22) which is arranged on the leadframe (16) and is in electrical contact with it and which contains an active, radiation-emitting and/or radiation-receiving region,
characterized in that the leadframe (16) is formed by a flexible multi-layered sheet (12, 14).

2. The surface-mountable miniature luminescent diode and/or photodiode as claimed in claim 1, characterized in that the flexible multi-layered sheet (12, 14) comprises a metal foil (12) and a plastic film (14) arranged on the metal foil and connected to it.

3. The surface-mountable miniature luminescent diode and/or photodiode as claimed in claim 2, characterized in that the plastic film (14) is adhesively bonded to the metal foil (12).

4. The surface-mountable miniature luminescent diode and/or photodiode as claimed in claim 2 or 3, characterized in that the metal foil (12) comprises a first chip connection region (18) and a second chip connection region (20), and in that the plastic film has openings (34, 36) in the regions arranged on these chip connection regions (18, 20).

5. The surface-mountable miniature luminescent diode and/or photodiode as claimed in claim 4, characterized in that the semiconductor chip (22) is arranged with a first contact area (24) on the first chip connection region (18), and is connected

with a second contact area (26) to the second chip connection region (20).

6. The surface-mountable miniature luminescent diode and/or photodiode as claimed in one of claims 2 to 5, characterized in that the thickness of the metal foil (12) is less than 80 µm, in particular between 30 µm and 60 µm inclusive.

7. The surface-mountable miniature luminescent diode and/or photodiode as claimed one of claims 2 to 6, characterized in that the plastic film is formed by an epoxy resin film (14).

8. The surface-mountable miniature luminescent diode and/or photodiode as claimed in one of claims 2 to 7, characterized in that the thickness of the plastic film (14) is less than 80 µm, in particular between 30 µm and 60 µm inclusive.

9. The surface-mountable miniature luminescent diode and/or photodiode as claimed in one of the preceding claims, characterized in that the semiconductor chip (22) is embedded in an encapsulating material (30).

10. The surface-mountable miniature luminescent diode and/or photodiode as claimed in one of the preceding claims, characterized in that the leadframe (16) has dimensions of approximately 0.5 mm × 1.0 mm or less.

11. The surface-mountable miniature luminescent diode and/or photodiode as claimed in one of the preceding claims, characterized in that the luminescent diode (10) has a total thickness of approximately 400 µm or less, preferably of approximately 350 µm or less.

12. A method for producing a surface-mountable miniature luminescent diode and/or photodiode, in particular as claimed in one of the preceding claims, with the method steps of:
    - providing a leadframe from a flexible multi-layered sheet which has a first chip connection region and a second chip connection region;
    - providing a semiconductor chip, which contains an active, radiation-emitting region and has a first contact area and a second contact area;
    - mounting the semiconductor chip with the first contact area on the first chip connection region of the leadframe;
    - connecting the second contact area to the second chip connection region of the leadframe; and
    - encapsulating the semiconductor chip with a transparent or translucent encapsulating material.

13. The method as claimed in claim 12, characterized in that the step of providing a leadframe comprises providing and punching a thin metal foil in order to define the first and second chip connection regions.

14. The method as claimed in claim 12 or 13, characterized in that the step of providing a leadframe comprises providing and punching a thin plastic film in order to define openings for the electrical connection of the semiconductor chip.

15. The method as claimed in claims 13 and 14, characterized in that the step of providing a leadframe comprises the adhesive bonding of the foil and the film.

16. The method as claimed in one of claims 12 to 15, characterized in that, in the encapsulating step, the encapsulating material is injection-molded, transfer-molded or sprayed onto the plastic film of the multi-layered sheet

17. The method as claimed in one of claims 12 to 16, characterized in that, in the encapsulating step, a runner is led through a plurality of chips arranged on the multi-layered sheet.

18. The method as claimed in one of claims 12 to 17, characterized in that the first and second chip connection regions of the leadframe are short-circuited and grounded in the steps of mounting the semiconductor chip, connecting the second contact area and encapsulating the semiconductor chip.

19. The method as claimed in one of claims 12 to 18, characterized in that a plurality of chips arranged on the multi-layered sheet are tested for their functional capability after the encapsulating step and in that, for this purpose, the individual chips are electrically isolated when they are mounted.